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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,246	10/31/2003	Harneet Bhugra	5646-117	2284

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EXAMINER

DOAN, DUC T

ART UNIT	PAPER NUMBER
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2188

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,246

Applicant(s)

BHUGRA ET AL.

Examiner

Duc T. Doan

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 and 42-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-8, 25-29 and 44-46 is/are allowed.
- 6) ☒ Claim(s) 1-3, 9-24, 30-39, 42 and 43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

Claims 1-46 have been presented for examination in this application. In response to the last Office Action, claims 1,4,13-16,221,23-25,36-37,42,44 have been amended. Claims 40,41 have been canceled. As a result, claims 1-39,42-46 are now pending in this application.

Applicant's remarks and amendments filed 11/30/05 have been fully considered with results as follows,

Claims 4-8,25-29,44-46 are allowed.

Claims 1-3,9-24,30-39,42-43 are rejected.

All rejections and objections not explicitly repeated below are withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3,9-24,30-38,42-43 rejected under 35 U.S.C. 103(a) as being unpatentable over APA (US Application 10/698246), in view of Malchior (US 6226710) and further in view of Regvev et al (US 6944710).

As for claim 1, APA describes an integrated search engine device, comprising: a content addressable memory (CAM) core that is configured to support at least one database of searchable entries therein (Fig 1: #36 cam core), and a control circuit that is configured to generate at least one signal at an output of the search engine device in response to detecting a done status of at least one of a plurality of result status signals that indicate states of completion of a corresponding plurality of contexts being handled by the search engine device (Fig 1: #40 done bit for each context, APA's pages 1-2 describes a done bit that indicates the validity of the corresponding result value generated at the completion of each context. The result value is further stored in the respective result mailbox). Although APA does not describe the claim's aspect of one signal at an output of the search engine device. However, Melchior describes a similar CAM search engine that is capable of supporting both polling and interrupt driven architectures (Melchior's column 6, lines 38-45). Melchior's column 9 lines 54-60 further describes an interrupt pin on the CAM engine that can be used in interrupt driven architecture to cause an interrupt to occur when output data becomes available in the output FIFO. It would have been obvious to one of ordinary skill in the art at the time of invention to include the completion detection methods and structures as suggested by Melchior in APA's system to support multiple completion architectures such as polling or interrupt driven thus allowing for the flexibility to optimize the host interface architectures and to maximize the throughput of the CAM engine (Melchior's column 9 lines 38-42). The claim recites and further configured to

generate a plurality of result status select signals that indicate whether or not corresponding ones of the plurality of result status signal are to be used by said control circuit to generate an aggregate result status signal as the at least one signal. APA and Melchio do not describe the claim's detail of generate results status signals. However, Regev describes an integrated CAM device capable of searching and matching results of multiple categories (Regev's Fig 1), having circuits to control of generation these multiple matching result signals (Regev's Fig 3) and indicating the "aggregate" matching result signal (Regev's Fig 4: #90). It would have been obvious to one of ordinary skill in the art at the time of invention to include the circuits to control and to generate multiple matching signals as suggested by Regev in APA's system thereby allowing the CAM device to simultaneously search data in different categories in a very efficient way (column 1 line 58 to column 2 line 15).

As for claim 2, APA describes wherein said CAM core and said control circuit are integrated on a common integrated circuit chip (APA's Fig 1 shows CAM cores #30, and control circuits are integrated in an IP co processor).

As for claim 3, the claim recites wherein the at least one signal comprises an interrupt. The claim rejected base on the same rationale as in the rejection of claim 1.

As for claim 9, APA describes wherein said control circuit further comprises a plurality of context specific result mailboxes that are configured to store return values associated with corresponding ones of the plurality of contexts; and a result status register that is configured to store done status values associated with the plurality of contexts (APA's Fig 1: #40 mailbox).

As for claim 10, APA describes wherein the search engine device is configured to support a maximum number N of contexts, and wherein said result status register comprises N single-bit storage devices (APA's Fig 1: #40 shows a single valid bit for each context).

As for claim 11, APA describes wherein the search engine device further comprises a memory mapped interface that is coupled to an M-bit wide data bus; and wherein a value of N/M equals a positive integer greater than one (APA's Fig 1, pages 1-2 describes multiple contexts are sharing the same memory mapped interface)

Claims 17,30 rejected based on the same rationale as in the rejection of claim 9.

Claims 18,31 rejected based on the same rationale as in the rejection of claim 10.

Claims 19,32 rejected based on the same rationale as in the rejection of claim 11.

As for claim 12, the claim recites wherein said control circuit further comprises interrupt and non-interrupt indication circuits that are configured to receive the plurality of result status signals. The claim rejected based on the same rationale as in the rejection of claim 1. Melchior further describes circuits to support both interrupt driven and non-interrupt driven architectures (Melchior's column 9 lines 38-40).

As for claim 13, the claim recites wherein said control circuit further comprises a result status select register that is configured to store result status routing information that is provided to said interrupt and non-interrupt indication circuits. The claim rejected based on the same rational as in the rejection of claims 1,12.

Claim 14,20,22,33,35 rejected based on the same rationale as in the rejection of claim 12.

Claim 15,21,23,34,36 rejected based on the same rationale as in the rejection of claim 13.

Claims 16,24,37,42 rejected based on the same rationale as in the rejection of claim 1.

As for claim 38, Melchoir describes wherein said control circuit comprises a finite state machine (Melchoir's column 10 lines 25-35 describes the CAM engines executing commands with multiples sequence steps).

Claim 43 rejected based on the same rationale as in the rejection of claim 3.

Claim 39 rejected under 35 U.S.C. 103(a) as being unpatentable over APA (US Application 10/698246), Malchior (US 6226710) as applied to claim 37, and further in view of Henderson et al (US Pub 2002/0080789).

As for claim 39, the claim recites wherein said control circuit comprises a round robin scheduler and finite state machine. APA and Melchior do not describe the claim's aspect of a scheduler. However, Henderson describes a switch-based network device with a switch scheduler to schedule and processing elements being received at appropriated time (Henderson's Fig 3: #320, page 4 paragraph 29). As for the round robin aspect of the claim, it has been known in the art that in the situation of receiving multiple requests with the same priority consideration, the requests are schedule in a normal round robin fashion, in order to achieve a fair and equal scheduling of these requests. It would have been obvious to one of ordinary skill in the art at the time of invention to include the switch scheduler and structures as suggested by Henderson in APA's system to resolve the execute order of multiple instructions, thereby allowing the device to executing several searching and packet modification simultaneously (Henderson's page 1 paragraph 13).

Response to Arguments

Applicant's arguments filed 11/30/05 have been fully considered but they are mooted in view of new ground(s) of rejection necessitated by the Applicant's amendments to the claims.

Allowable Subject Matter

Claims 4-8,25-29,44-46 are allowed.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Applicant's amendment filed 8/18/03 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

When responding to the office action, Applicant is advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duc T. Doan whose telephone number is 571-272-4171. The examiner can normally be reached on M-F 8:00 AM 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin L. Ellis
Primary Examiner

